

TRANSMITTAL LETTER TO THE UNITED STATES  
DESIGNATED/ELECTED OFFICE (DO/EO/US)  
CONCERNING A FILING UNDER 35 U.S.C. 371

JC05 Rec'd PCT/PTO 2 7 SEP 2001

U.S. APPLICATION NO. (If known, see 37 CFR 1.5)

09/937772

INTERNATIONAL APPLICATION NO.

INTERNATIONAL FILING DATE

PRIORITY DATE CLAIMED

PCT/CA00/00350

30 March 2000

30 March 1999

TITLE OF INVENTION

ON-SITE CONCRETE TRUCK WASH-OUT APPARATUS

APPLICANT(S) FOR DO/EO/US

Barry, C. Marvin (inventor)/Ocean Construction Supplies Limited (Assignee)

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below.
4. ☒ The US has been elected by the expiration of 19 months from the priority date (Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
  - a. ☒ is attached hereto (required only if not communicated by the International Bureau).
  - b. ☐ has been communicated by the International Bureau.
  - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☐ An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
  - a. ☐ is attached hereto.
  - b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4).
7. ☐ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
  - a. ☐ are attached hereto (required only if not communicated by the International Bureau).
  - b. ☐ have been communicated by the International Bureau.
  - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
  - d. ☐ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)).
9. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☒ An English language translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11 to 20 below concern document(s) or information included:

11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☐ A **FIRST** preliminary amendment.
14. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
15. ☐ A substitute specification.
16. ☐ A change of power of attorney and/or address letter.
17. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.
18. ☐ A second copy of the published international application under 35 U.S.C. 154(d)(4).
19. ☐ A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
20. ☒ Other items or information:

Certificate of Mailing by Express Mail No. EL915418756US  
Certificate Under CFR §3.73

21. ☒ The following fees are submitted:**BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)):**

Neither international preliminary examination fee (37 CFR 1.482)  
nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO  
and International Search Report not prepared by the EPO or JPO ..... \$1000.00

International preliminary examination fee (37 CFR 1.482) not paid to  
USPTO but International Search Report prepared by the EPO or JPO ..... \$860.00

International preliminary examination fee (37 CFR 1.482) not paid to USPTO  
but international search fee (37 CFR 1.445(a)(2)) paid to USPTO ..... \$710.00

International preliminary examination fee (37 CFR 1.482) paid to USPTO  
but all claims did not satisfy provisions of PCT Article 33(1)-(4) ..... \$690.00

International preliminary examination fee (37 CFR 1.482) paid to USPTO  
and all claims satisfied provisions of PCT Article 33(1)-(4) ..... \$100.00

**ENTER APPROPRIATE BASIC FEE AMOUNT =****CALCULATIONS PTO USE ONLY**

\$ 860.00

Surcharge of \$130.00 for furnishing the oath or declaration later than ☐ 20 ☒ 30  
months from the earliest claimed priority date (37 CFR 1.492(e)).

\$ 130.00

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	\$
Total claims	12 - 20 =		x \$18.00	\$
Independent claims	2 - 3 =		x \$80.00	\$
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ \$270.00	\$

**TOTAL OF ABOVE CALCULATIONS =**

\$ 990.00

☐ Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above  
are reduced by 1/2.

+

**SUBTOTAL =**

\$ 990.00

Processing fee of \$130.00 for furnishing the English translation later than ☐ 20 ☐ 30  
months from the earliest claimed priority date (37 CFR 1.492(f)).

\$

**TOTAL NATIONAL FEE =**

\$ 990.00

Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be  
accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +

\$

40.00

**TOTAL FEES ENCLOSED =**

\$1030.00

**Amount to be  
refunded:**

\$

**charged:**

\$

- a. ☒ A check in the amount of \$ 1030.00 to cover the above fees is enclosed.
- b. ☐ Please charge my Deposit Account No. \_\_\_\_\_ in the amount of \$ \_\_\_\_\_ to cover the above fees.  
A duplicate copy of this sheet is enclosed.
- c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any  
overpayment to Deposit Account No. 03-1550 A duplicate copy of this sheet is enclosed.
- d. ☐ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. **Credit card  
information should not be included on this form.** Provide credit card information and authorization on PTO-2038.

**NOTE:** Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR  
1.137 (a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

CHERNOFF, VILHAUER, McCLUNG & STENZEL LLP  
Attorneys at Law  
1600 ODS Tower  
601 S.W. Second Avenue  
Portland, Oregon 97204-3157

SIGNATURE

Charles D. McClung

NAME

26,568

REGISTRATION NUMBER

**ON-SITE CONCRETE TRUCK WASH-OUT APPARATUS**

**Technical Field**

- 5                    This application relates to an apparatus and method for containing and filtering rinse water, sediment and aggregate resulting from washing the hopper and discharge chute components of a concrete truck at a construction site after use. The apparatus includes a truck-mounted pump for automatically recirculating the rinse water and relatively small
- 10   particle size sediment from a container mountable at the end of the discharge chute to the mixing drum of the concrete truck.

**Background**

- 15                    Conventional concrete trucks include large drum containers for mixing aggregate, sand and cement slurry together. The concrete is discharged from the drum into a hopper and down a chute to the desired discharge location, such as into a concrete pump or bucket.
- 20                    After concrete has been fully discharged from the truck, the operator must rinse debris adhering to the discharge hopper and outlet chute before leaving the construction site. Accordingly, the contractor must provide a designated location at the construction site where this rinsing operation may occur. This is often inconvenient and inefficient,
- 25   especially if the rinsing station is located at a site remote from the concrete discharge location.

- 2 -

Moreover, concrete truck wash-off can pose serious environmental concerns. In many cases precautions must be taken at the construction site to ensure that sediment and cementitious debris does not contaminate the site or adjoining waterways. Enforcement of environmental regulations at construction sites is becoming increasingly stringent and hence it is anticipated that this issue will become more prominent in the future.

United States Patent No. 5,685,978, Petrick et al., dated 11 November, 1997 exemplifies the prior art. Petrick et al. discloses a concrete reclaimer which is positioned at a designated location at a construction site. In use, once a concrete truck finishes placing a load of concrete, it backs up to the location of the reclaimer to a position where the end of its delivery chute is disposed above the reclaimer. The chute and other delivery equipment is then washed with a stream of water ordinarily supplied from the truck. The reclaimer includes a separating screen for separating aggregate from sand and uncured cement. After the washing operations, the reclaimer may be transported to a recycling facility where the aggregate, sand, cement and water is removed and reused in the manufacture of fresh concrete. The Petrick et al. reclaimer is portable but only with the use of heavy equipment, such as a fork lift. For example, in order to transport the reclaimer to the recycling facility, the reclaimer must be lifted on to a flatbed truck or the like.

Some concrete supply companies have developed truck-mounted wash-off containment systems. However, existing systems are

- 2a -

unreliable and are not user-friendly. According to one existing system developed by Lafarge Canada Inc., a funnel is removably mounted at the end of the truck discharge chute before the hopper and chute are rinsed. The funnel directs rinse water and sediment adhering to the hopper and chute into a 5 gallon (approximately 20 litre) bucket which is positioned on the ground. The operator is then required to lift the bucket and carry it to a 15 gallon (approximately 60 litre) pressurized tank which is mounted on a truck frame immediately behind the truck cab. The contents of the bucket are then carefully dumped into the tank inlet through a metal screen which filters out larger size aggregate granules. After the tank is pressurized, a discharge valve is opened and the sediment and rinse water is blown through a discharge hose into the truck mixing drum.

The Lafarge system suffers from several shortcomings. The need to manually lift the 5 gallon (approximately 20 litre) containment bucket from ground level, carry the bucket to the pressurized tank, and carefully discharge the bucket

- 3 -

contents into the pressurized tank inlet mounted at waist level requires considerable manual labour and increases the risk of lower back injuries, especially in older workers.

5           The valves of the pressurized tank also have a tendency to become clogged with slurry. This increases maintenance costs and results in reduced operator compliance. Further, depending upon the location where the pressurized tank is mounted, it may not be possible to generate a sufficient degree of air pressure in the tank to fully discharge the entire  
10 tank contents into the truck mixing drum which exacerbates the clogging problem.

          The need has therefore arisen for an improved system for containing concrete truck wash-off and automatically recirculating it back  
15 into the mixing drum of the truck.

### Summary of Invention

          In accordance with the invention, a wash-off containment and  
20 recirculating apparatus is described for use in association with a concrete truck having a mixing drum and a discharge chute. The apparatus comprises a container removably mountable on the end of the discharge chute, the container having an open upper end, a screen removably positionable within the container and an outlet located in a lower portion  
25 of the container below the screen. The apparatus further includes a pump mountable on the truck, the pump having a suction hose extending

- 4 -

- between the container outlet and the pump; and a discharge hose extending from the pump to an open end discharging into the mixing drum. When the pump is operating, rinse water and relatively small particle size sediment flowing down the chute and into the container is automatically conveyed through the suction and discharge hoses into the mixing drum. Preferably, the screen has openings approximately  $\frac{1}{4}$  inches (approximately 6.35 mm) in diameter to trap relatively large particle size aggregate, thereby preventing clogging of the pump fittings.
- 10           The screen may further include a handle on its upper surface for lifting the screen and any of the relatively large particle size aggregate which has accumulated thereon from the container. Optionally, a filter may be mounted in the container outlet as an additional safeguard.
- 15           Preferably the pump comprises an air-operated diaphragm pump connectable to the pressurized air supply of the truck. In order to minimize the length of the discharge hose, the pump is preferably mounted in a rear portion of the truck proximate the mixing drum. A frame may also be provided on the truck for securely storing the container when it is
- 20   not in use.

- 5 -

Brief Description of Drawings

5 In drawing which illustrate the preferred embodiment of the invention, but which should not be construed as restricting the spirit or scope thereof,

10 Figure 1 is an isometric view of the applicant's wash-off containment and recirculating apparatus mounted on a conventional concrete mixing truck;

15 Figure 2 is a side elevational view of the apparatus of Figure 1 and showing the container component in dotted outline in the storage position;

Figure 3 is a top plan view of the apparatus of Figure 1;

20 Figure 4 is a rear elevational view of the apparatus of Figure 1; and

Figure 5 is an enlarged cross-sectional view of the container component of the applicant's apparatus.



- 6 -

Description

This application relates to a wash-off containment and recirculating apparatus for use in conjunction with a conventional concrete mixer truck 10. As shown in Figure 1, truck 10 includes a large mixing drum 14 for mixing aggregate, sand and cement slurry together. Mix materials are introduced into drum 14 by means of a charging hopper 15. Concrete is discharged from drum 14 into a discharge hopper 16 and down a chute 18 to the desired discharge location, such as into a concrete pump or bucket.

After concrete has been discharged from truck 10 as aforesaid, it is necessary to rinse discharge hopper 16 and chute 18 to remove any sediment or other cementitious debris before truck 10 exits the construction site. This rinsing step is usually performed at a designated wash-off station at the construction site. The purpose of the applicant's invention is to enable the rinsing step to be performed anywhere by containing the rinse water and sediment and automatically recirculating it to mixing drum 14, except for relatively large particle size aggregate which is disposed of separately.

The applicant's apparatus includes a container 20 which is mounted on a frame 21 secured to truck 10 when not in use (Figure 2). As shown best in Figure 5, container 20 includes a closed bottom end 22, sidewalls 24 and an open upper end 31. A pair of hooks 28 are provided at the upper front end of container 20 for removably securing container 20

- 7 -

to the end of truck discharge chute 18 (Figure 2). When secured to chute 18 as shown in Figure 2, container 10 receives substantially all of the rinse water and debris flushed down chute 18. If multiple chute extensions have been used, then container 20 is mounted on the lowermost extension.

- 5 Container 20 is preferably constructed from lightweight aluminum for ease of handling.

- 10 A screen 23 having a plurality of openings 25 is removably positionable within container 20 as shown best in Figure 5. Openings 25 are approximately  $\frac{1}{4}$  inch (approximately 6.35 mm) in diameter to permit the passage of rinse water and relatively small particle size sediment therethrough. Larger particle size aggregate is trapped by screen 23. Screen 23 has a handle 26 on its upper surface for ease in removing screen 23 and any accumulated aggregate from container 20. As shown in Figure 15 5, screen 23 is removably supported on a plurality of metal tabs 27 within container 20 at an incline and at an elevation above closed bottom end 22.

- 20 Container 20 has an outlet port 29 located in a lower portion thereof below screen 23. A filter 30 is mounted in outlet port 29 to screen any large size aggregate or sediment particles which have passed into the container lower portion (due to misalignment of screen 23, for example).

- 25 The applicant's apparatus also includes a truck-mounted pump 32 having a suction hose 34 and a discharge hose 36 (Figures 1 - 4). Preferably pump 32 is an air operated diaphragm pump which is connectable to the pressurized air supply 33 of truck 10 (Figure 2). A

- 8 -

Wilden™ M4 air operated double diaphragm pump available from Wilden Pump & Engineering Company of Grand Terrace, California is suitable for this purpose.

- 5                   Suction hose 34, which is preferably about 1½ inches (approximately 38.1 mm) in diameter, connects pump 32 to container outlet port 29. Conventional male/female cam lock fittings may be used to ensure a secure connection. Discharge hose 36 has one end connected to pump 32 and an open end 38 emptying into charging hopper 15, as best
- 10   shown in Figures 3 and 4. Discharge hose 36 is preferably secured to the outer surface of truck 10 with a plurality of brackets. Pump 32 is mounted on a rear side portion of truck 10 to minimize the length of discharge hose 36 and hence the effective pumping force required.
- 15                   In use, concrete mixer truck operators are required to rinse the truck discharge hopper 16 and chute 18 after use before exiting a construction site. The rinsing operation can conveniently be performed at any location using the applicant's invention by first mounting container
- 20   20 at the end of chute 18 using hooks 28. Screen 23 is pre-positioned within container 20 and suction hose 34 is releasably secured to container outlet port 29 as discussed above.

25                   The operator then activates pump 32 and thoroughly rinses discharge hopper 16 and chute 18 to flush any loose sediment or other debris into container 20. The rinse water and relatively small particle size sediment passes through screen 23 into the lower portion of container 20

- 9 -

where it is automatically drawn into suction hose 34 through outlet port 29. The rinse water and sediment is then conveyed by the action of pump 32 into the discharge hose 36 which empties into charging hopper 15 through open end 38 when hopper 15 is the upright position shown in the drawings  
5 (Figures 3 and 4). The recirculated rinse water and sediment then flows by gravitational forces down a sloped plate located at the bottom of charging hopper 15 back into mixing drum 14. The upper portion of discharge hose 36 is sufficiently flexible to accomodate pivoting movement of charging hopper 15 when the applicant's invention is not in use.

10

The larger size sediment particles and aggregate are trapped by screen 23. Screen 23 and any accumulated aggregate may be easily removed from container 20 by lifting screen 23 using handle 26. The accumulated aggregate may either be dumped at a suitable location at the  
15 construction site or returned to the concrete supply company for disposal.

- 10 -

WHAT IS CLAIMED IS:

1. A wash-off containment and recirculating apparatus for use in association with a concrete truck (10) having a mixing drum (14) and a discharge chute (18), said apparatus comprising a container (20) comprising an open upper end (31), a screen (23) removably positionable within the container (20) and an outlet (29) located in a lower portion of the container (20) below the screen (23), characterized in that said container is removably mountable on the end of said discharge chute (18) and said apparatus further comprises:
  - (a) a pump (32) mountable on said truck (10);
  - (b) a first hose portion connectable to said outlet (29); and
  - (c) a second hose portion in communication with said first hose portion and having an open end emptying into said mixing drum (14);
- 20 wherein operation of said pump (32) automatically conveys any rinse water and sediment capable of passing through said screen (23) from said lower portion of said container (20) to said mixing drum (14) through said first and second hose portions.
- 25 2. The apparatus of claim 1, wherein said screen (23) has a plurality of openings (25) approximately  $\frac{1}{4}$  inches (approximately

- 11 -

mm) in diameter for permitting said water and said sediment to pass therethrough but which prevents the passage of aggregate.

3. The apparatus of claim 2, wherein said screen (23) further  
5 comprises a handle (26) on its upper surface for lifting said screen (23) and any of said aggregate which has accumulated thereon from said container (20).

4. The apparatus of claim 2, further comprising a filter (30)  
10 mounted in said container outlet (29).

5. The apparatus of claim 1, wherein said pump (32) comprises an air-operated diaphragm pump.

15 6. The apparatus of claim 5, wherein said pump (32) is connectable to the pressurized air supply (33) of said truck (10).

7. The apparatus of claim 1, wherein said first hose portion comprises a suction hose (34) extending between said pump (32) and said  
20 container outlet (29), and said second hose portion comprises a discharge hose (36) extending from said pump (32) to said mixing drum (14).

8. The apparatus of claim 7, wherein said pump (32) is mountable in a rear portion of said truck (10) proximate said mixing drum  
25 (14) to minimize the length of said discharge hose (36).

- 12 -

9. The apparatus of claim 1, further comprising a frame (21) mountable on said truck (10) for securely supporting said container (20) when it is not in use.

5 10. The apparatus of claim 7, wherein the truck further includes a charging hopper (15) in communication with the mixing drum (14) and wherein said discharge hose (36) is mountable on said truck (10) so as to discharge into the charging hopper (15).

10 11. A method of rinsing a vehicle adapted for discharging concrete mix materials, the vehicle having a mixing drum (14), a discharge hopper (16) and a discharge chute (18), characterized in that said method comprises:

15 (a) providing a container (20) mountable on said vehicle, said container (20) having a screen (23) removably positionable within said container (20) and an outlet (29) located in a lower portion of said container (20) below said screen (23);

20 (b) removably positioning said container (20) at a lower end of said discharge chute (18);

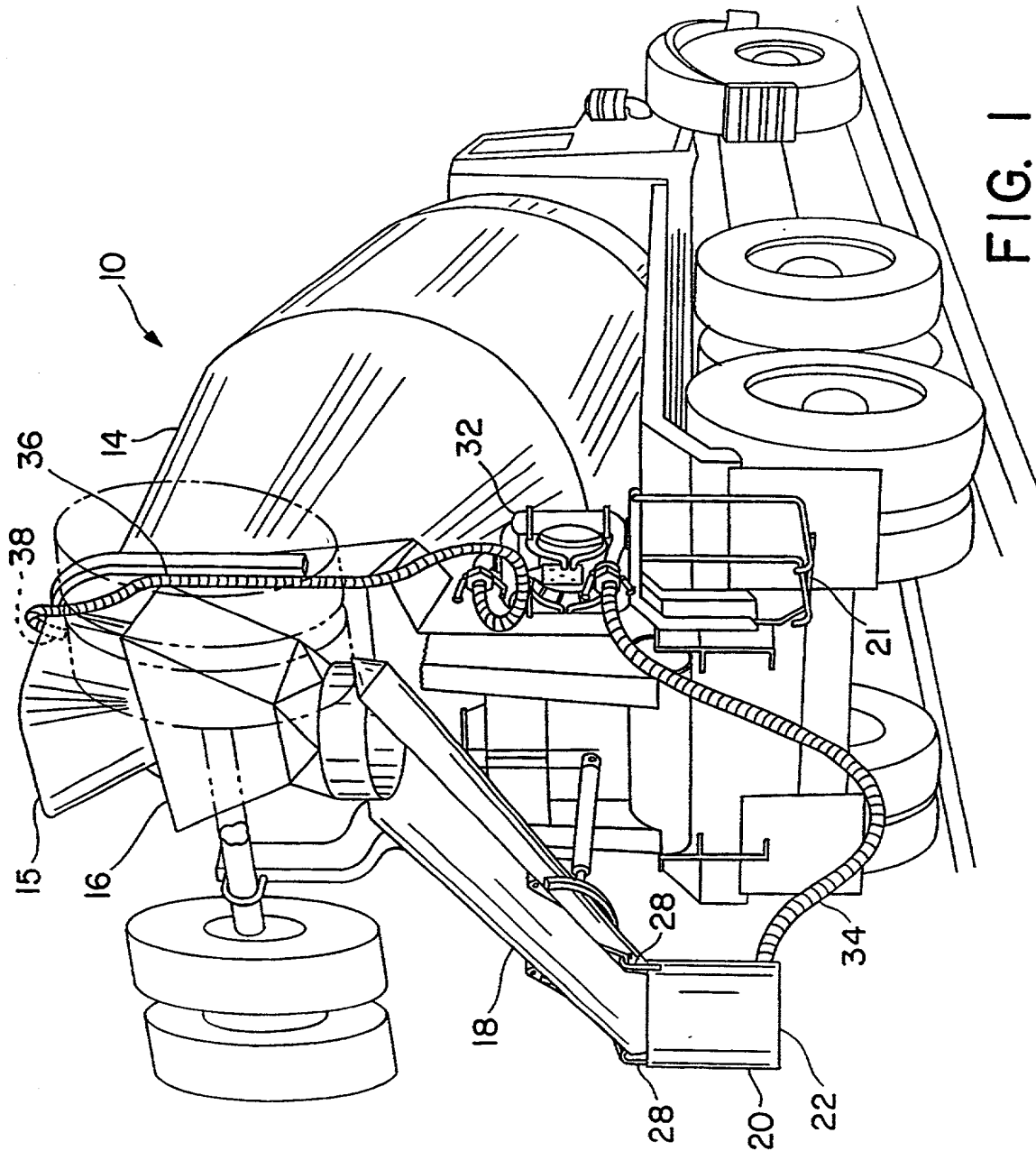
(c) rinsing said discharge chute (18) and discharge hopper (16) with  
rinse water to wash sediment and aggregate present therein into said  
25 container (20); and

- 13 -

(d) pumping said rinse water and sediment passing through said screen (23) from said outlet (29) of said container (20) into said mixing drum (14).

- 5 12. The method of claim 11, wherein said container (20) is removably mounted on a lower end of said discharge chute (18) during said rinsing and pumping steps.





2 / 5

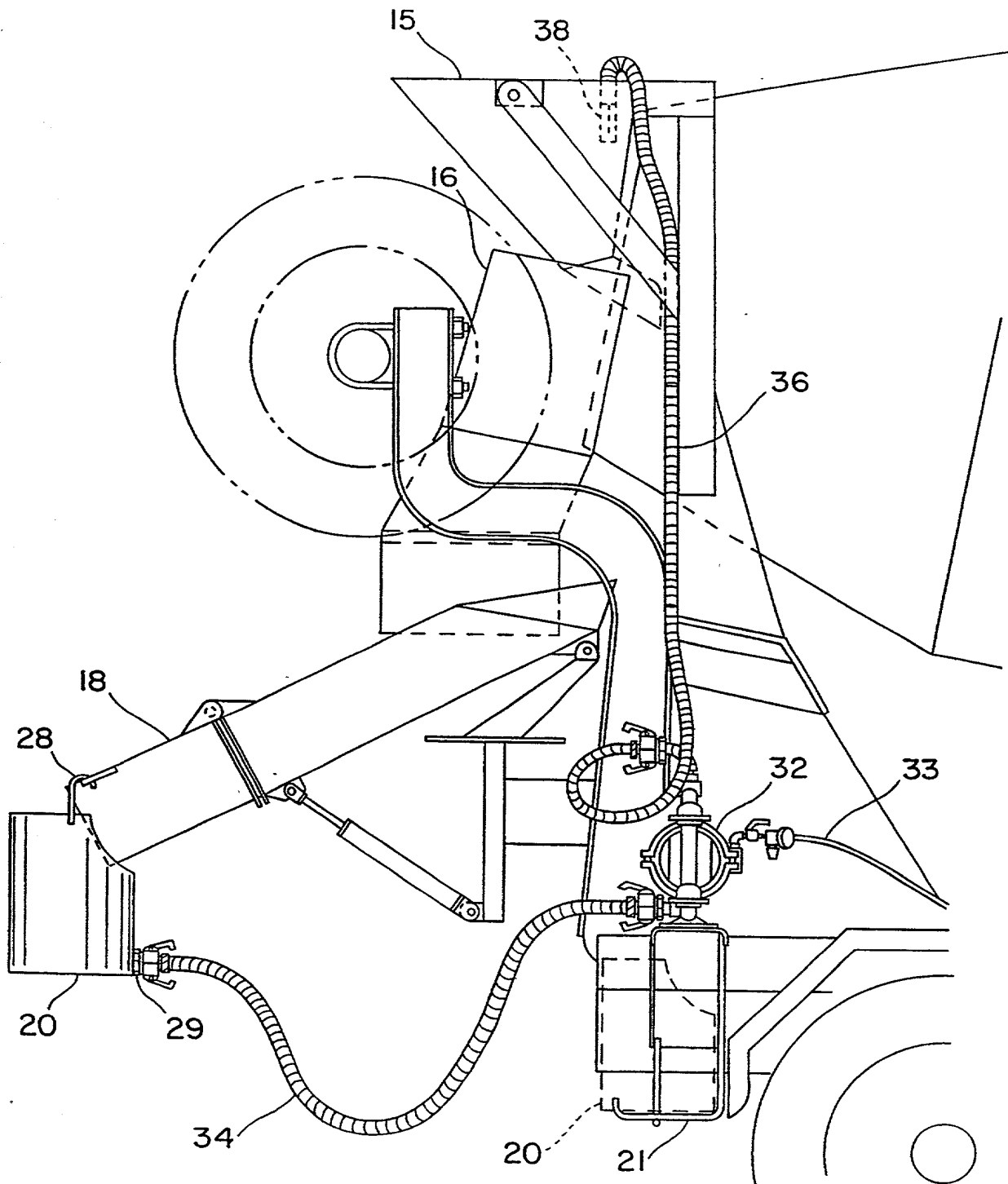


FIG. 2

SUBSTITUTE SHEET (RULE 26)

3 / 5

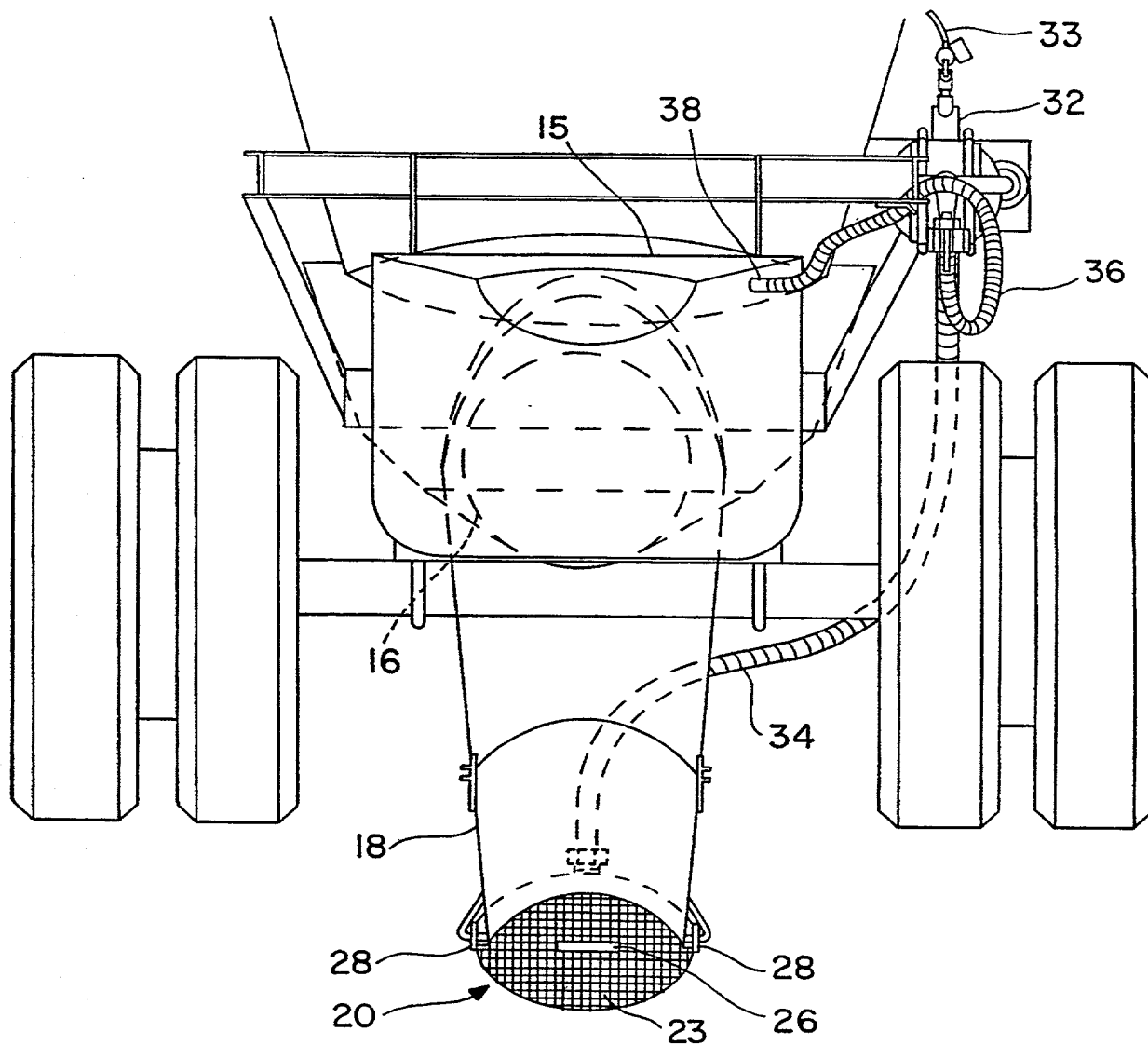


FIG. 3

4 / 5

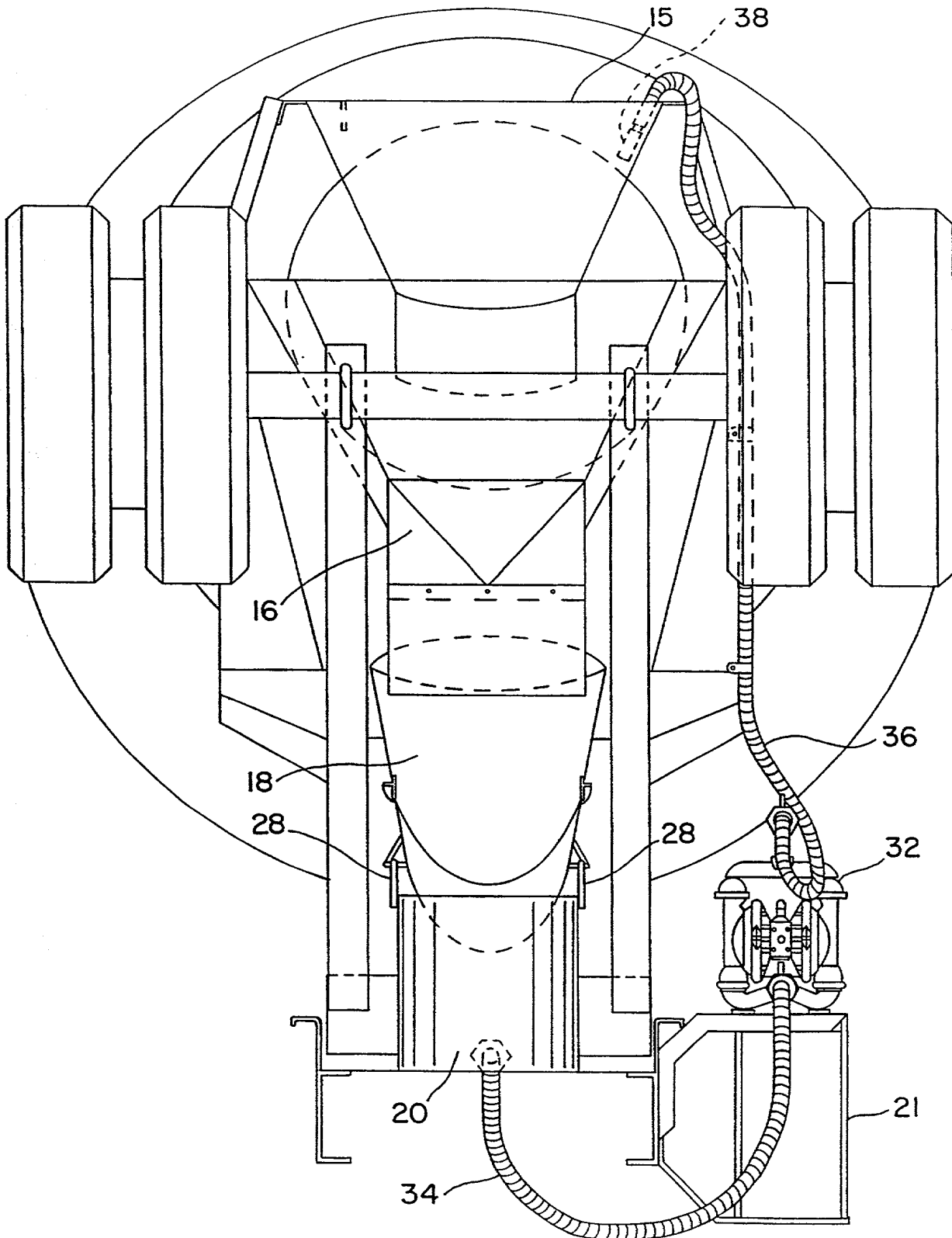


FIG. 4

SUBSTITUTE SHEET (RULE 26)

5/5

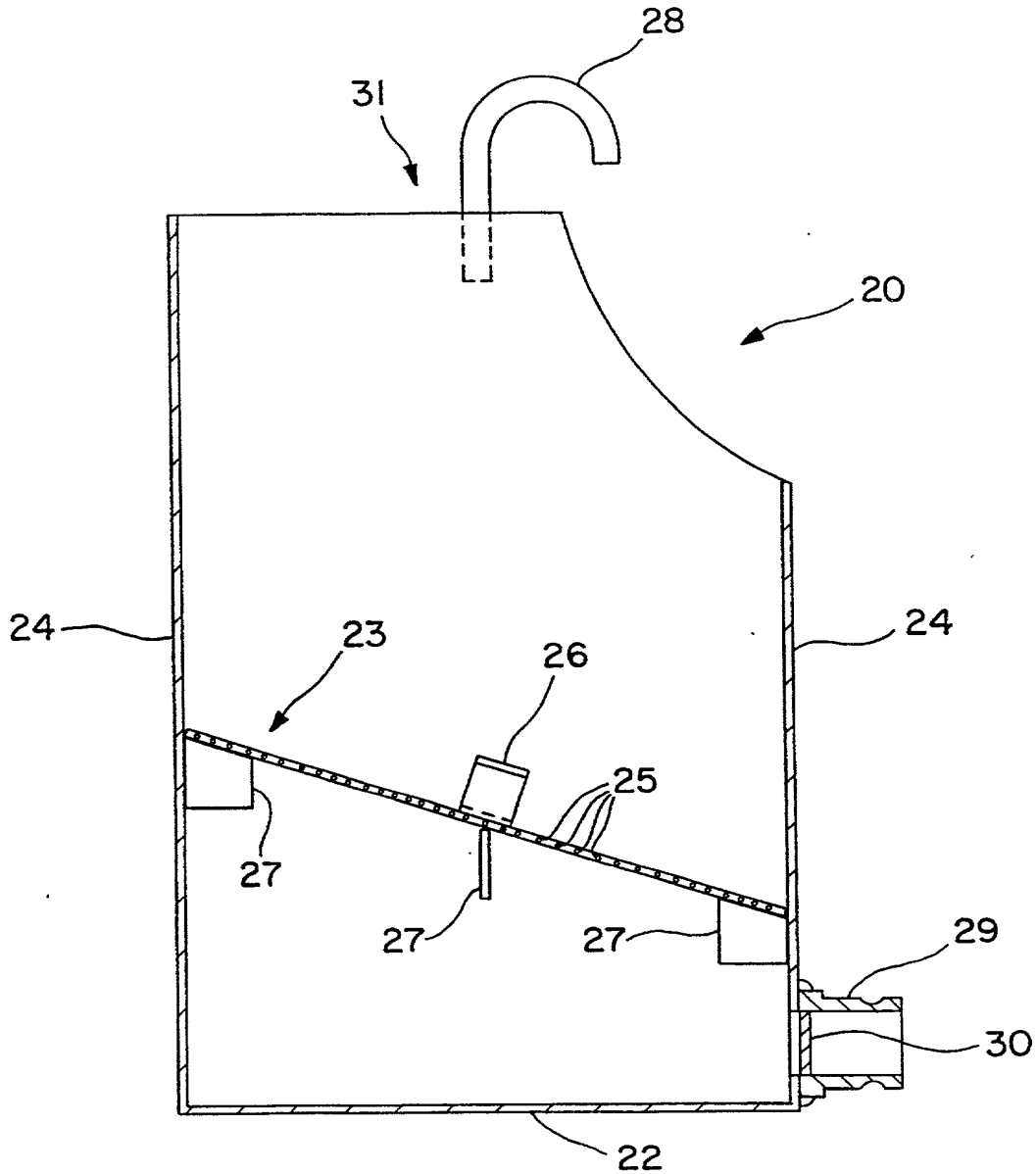
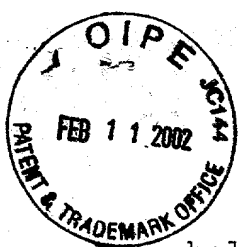


FIG. 5



**DECLARATION**

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

**ON-SITE CONCRETE TRUCK WASH-OUT APPARATUS**

the specification of which

☒ is attached hereto.

was filed on \_\_\_\_\_ as

☐ Application Serial No. \_\_\_\_\_

and was amended on \_\_\_\_\_

(if applicable)

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)

Priority  
Claimed

<u>2,267,582</u> (Number)	<u>Canada</u> (Country)	<u>March 30, 1999</u> (Day/Month/Year Filed)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)	<input type="checkbox"/> Yes <input type="checkbox"/> No
_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)	<input type="checkbox"/> Yes <input type="checkbox"/> No

I hereby claim the benefit under 35 U.S.C. § 119(e) of any United States provisional application(s) listed below:

(Application Serial No.)

(Filing Date)

(Application Serial No.)

(Filing Date)

I hereby claim the benefit under Title 35, United States Code, §120, of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Ser. No.)

(Filing Date)

(Status)

(patented, pending, abandoned)

(Application Ser. No.)

(Filing Date)

(Status)

(patented, pending, abandoned)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Dated: Jan 4/002

Full name of sole/first inventor

Residence

Post Office Address

Citizenship

Barry, C. Marvin

11688 Darby Street

Maple Ridge, British CAX.

Columbia V5X 5E9

Canada